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ABSTRACT

Minicourse 4 on interaction analysis, an autoinstructional package based on the use of microteaching and the videotape recorder, was designed (1) to train teachers to categorize their own classroom behavior, using Flanders' system, to an 80 percent correct criterion level; (2) to increase frequency in classroom discussions of category 2, 3, and 4 behavior and decrease category 5 behavior, i.e., shift teacher behavior in the direction of indirect teaching; (3) train teachers in the fundamentals of matrix analysis and its possible significance. The course consists of seven instructional sequences taking approximately 15-16 days. Instructional materials include closely integrated handbook and videotape materials for use in developing coding procedures and model clips illustrating teacher strategies for use in presenting rationale for behavioral change. After preliminary field testing, the main field test was conducted using 24 teachers (volunteers) from whom videotaped discussion lessons were collected before and after the course. Findings: (1) Coding accuracy was 60-70 percent at a 5-second pace. (2) The second objective was achieved, the change appearing to be more a result of instructional lessons than microteaching. (3) Teachers were inadequate in interpreting matrices. Minicourse 4 will be revised to allow more time for coding more training clips and more training in matrix analysis. (Course outline and complete findings are included.) (JS)

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The Minicourse As A Tool For Training Teachers In Interaction Analysis

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THE MINICOURSE AS A TOOL FOR TRAINING TEACHERS IN INTERACTION ANALYSIS

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Introduction

Educators have long been aware that classroom climate, frequently defined in terms of teacher-pupil interaction, is an important factor in the learning process. The large number of observational instruments created to analyze this interaction, as well as the accompanying research data, are an indication of how significant educational researchers consider this problem (Simon and Boyer, 1967). In spite of this widespread interest and activity, only a few of these instruments have gained widespread popularity. Flanders' System of Interaction Analysis is undoubtedly the most extensively used and documented instrument (Flanders, 1967).

Flanders' System

Flanders' System is a ten-category observational schedule based around teacher-pupil verbal interaction. The ten categories are mutually exclusive, with seven pertaining specifically to teacher behavior. Figure 1 lists and describes these categories (Amidon and Flanders, 1967, p. 14).

Teacher influence, according to Flanders, can be divided into two distinct modes: indirect or direct. Indirect teacher skills (Categories 1 through 4) supposedly structure a learning environment where pupils find opportunities for extended participation. On the other hand, direct teacher influence (Categories 5 through 7) is considered more restrictive in terms of pupil behavior.

Figure 1
(Amidon and Flanders, 1967; p. 14)

SUMMARY OF
CATEGORIES FOR INTERACTION ANALYSIS

TEACHER TALK	INDIRECT INFLUENCE	1. *ACCEPTS FEELING: accepts and clarifies the feeling tone of the students in a nonthreatening manner. Feelings may be positive or negative. Predicting and recalling feelings are included. 2. *PRAISES OR ENCOURAGES: praises or encourages student action or behavior. Jokes that release tension, not at the expense of another individual, nodding head or saying "uh huh?" or "go on" are included. 3. *ACCEPTS OR USES IDEAS OF STUDENT: clarifying, building, or developing ideas or suggestions by a student. As teacher brings more of his own ideas into play, shift to category five. 4. *ASKS QUESTIONS: asking a question about content or procedure with the intent that a student answer.
	DIRECT INFLUENCE	5. *LECTURES: giving facts or opinions about content or procedure; expressing his own idea; asking rhetorical questions. 6. *GIVES DIRECTIONS: directions, commands, or orders with which a student is expected to comply. 7. *CRITICIZES OR JUSTIFIES AUTHORITY: statements, intended to change student behavior from nonacceptable to acceptable pattern; bawling someone out; stating why the teacher is doing what he is doing, extreme selfreference.
STUDENT TALK		8. *STUDENT TALK-RESPONSE: talk by students in response to teacher. Teacher initiates the contact or solicits student statement. 9. *STUDENT TALK-INITIATION: talk by students, which they initiate. If "calling on" student is only to indicate who may talk next, observer must decide whether student wanted to talk. If he did, use this category.
		10. *SILENCE OR CONFUSION: pauses, short periods of silence, and periods of confusion in which communication cannot be understood by the observer.

* There is NO scale implied by these numbers. Each number is classificatory, designating a particular kind of communication event. To write these numbers down during observation is merely to identify and enumerate communication events, not to judge them.

Paralleling this teacher behavior dichotomy, Flanders' system also categorizes pupil behavior as extended or restricted. Pupil behavior is observed as being either a direct response to the teacher (Category 8), or pupil-initiated (Category 9).

Observer scoring is done in consecutive three-second intervals, and the scores are transferred to a 10 x 10 matrix for systematic analysis (Flanders, 1967). An acceptable observer reliability is about .85, using Scott's pi coefficient (Scott, 1955).

It is difficult to determine precisely why Flanders' system is so popular. Undoubtedly there are a number of reasons, and we shall suggest a few. First, the category system appears fairly simple, with category definitions couched in the everyday language of teachers and administrators. Second, some packaged materials have been provided to aid in training users. Third, there is a substantial amount of data which indicates that learning Flanders' system does bring about differences in teacher and pupil classroom performances (Amidon and Hough, 1967). However, the findings are not clear-cut with respect to the kinds of behaviors changed, and often the statistical differences are meaningless in terms of practical significance.

The Minicourse

Acknowledging the widespread application of Flanders' system, the Far West Laboratory for Educational Research and Development decided to develop a minicourse based on Interaction Analysis. Basically, the minicourse is an auto-instructional package based around the use of microteaching and the videotape recorder (Borg, et al, 1970). Microteaching is essentially a miniature classroom situation in which

the teacher practices one or more skills in a short lesson with a small group of pupils. The lesson is simultaneously videotaped and subsequently critiqued by the teacher.

The instructional materials and subsequent microteach and reteach sessions are organized into units called instructional sequences. The usual minicourse has four to six instructional sequences (Langer, 1969a).

The success of the minicourse model has been demonstrated with a wide variety of teaching skills (Langer, 1969b).

Minicourse 4

The major objectives of this minicourse (hereafter referred to as Minicourse 4) are based on a careful analysis of the system as well as the research data. The decision was made not only to teach Flanders' system (including matrix analysis), but to show teachers how to systematically modify their use of categories 2, 3, 4, and 5 in discussions. We felt that the mixture of successes and/or failures in studies involving Flanders' system might have been due in part to differences in the amount of teacher practice with respect to the specific categories.

Our reasoning was not without foundation. The training of teachers to use Flanders' system shows a wide range of approaches. One school of thought argues that simply knowing Flanders' system produces change in behavior. Under this system teachers learn to code the specific categories (using pre-selected audio-tapes) to a minimal level of reliability. The effects of this learning are then measured by having observers code the teachers' classrooms to see what differences have resulted from the training.

The second school of thought argues that practice in the skills is necessary to produce changes in teacher behavior. This training paradigm emphasizes role-playing and microteaching (Amidon and Flanders, 1967). Flanders seems to feel that the latter approach produces more substantive results (Flanders, personal communication). Certainly our own minicourses indicate that telling is just not as effective as doing.

In addition to the unique features of the minicourse model, Minicourse 4 departs radically from many of the traditional approaches to teaching Interaction Analysis. Foremost among these changes are: (1) The categories are introduced in pairs, starting with categories 1 and 2; and (2) the three-second pacing is gradually developed through the use of tones occurring at three-second intervals. Minicourse 4 consists of seven Instructional Sequences, taking approximately 15-16 days. The general objectives and instructional sequences are as follows:[1]

General Objectives

(1) Train teachers to categorize their own classroom behavior, using Flanders' System, to an 80% correct criterion level.

(2) Increase frequency in classroom discussions of Categories 2, 3, and 4; and decrease frequency of Category 5 behavior.[2]

(3) Train teachers in the fundamentals of matrix analysis and its possible significance.

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[1] A complete daily course sequence is included in the Appendix.

[2] The course attempted to shift teacher behavior in the direction of indirect teaching, insofar as discussion lessons are concerned.

Instructional Sequences

Instructional Sequence 1 - Introduce teachers to Flanders' System

Instructional Sequence 2 - Code categories 1 and 2

Instructional Sequence 3 - Code categories 3 and 4

Instructional Sequence 4 - Code categories 5 through 7

Instructional Sequence 5 - Code categories 8 and 9 and behavioral shifts

Instructional Sequence 6 - Selective use of category 2 and 3 behaviors in discussions

Instructional Sequence 7 - Selective use of category 4 and 5 behaviors in discussions.

The reader will note that the first five instructional sequences in Minicourse 4 are devoted exclusively to training in Flanders' system. The coding procedures are developed using closely integrated handbook and videotape materials. The specific procedures used to accomplish the first objective are essentially as follows:

(1) The teacher reads about and sees videotaped illustrations of the specific category behaviors. To repeat a point made earlier, the categories are presented in pairs.

(2) The teacher then codes a number of pre-scored videotaped training clips which contain instances of these categories (as well as all the others). Each training clip is scored twice.

The second procedure requires more explanation. The first time through the trainee codes the behaviors without feedback. As noted previously, the behaviors to be coded are marked off in three second intervals using pairs of tones.[3] The training clip is replayed immediately (with the tones), but is stopped

[3] At the beginning, teachers code only the behaviors which occur at the onset of the first tone. Behavioral changes occuring during the three second interval are not coded.

directly after each behavior is coded. At this point feedback is provided concerning the correct category. In the earlier instructional sequences, when the teacher is scoring relatively few behaviors, the tones occur rather infrequently. The coding pace is slow and teachers are very accurate.

As the number of categories to be coded increases, so does the relative density of the tones. Eventually the teacher is coding at a consecutive three second interval pace, which is marked by a metronome. At this time the concept of behavioral shifts is introduced, and teachers now score all behaviors regardless of when they occur. The teachers are now ready to code their own microteach tapes.

The second objective of Minicourse 4 is to increase teacher use of Categories 2, 3, and 4 behaviors and decrease Category 5. Instructional sequences 6 and 7 emphasize the rationale for these changes and present model clips illustrating teacher strategy. In addition, the teachers microteach and analyze their own tapes for these behaviors.

Preliminary Field Test

A preliminary form of Minicourse 4 was tested in the summer of 1969 at a local East Bay high school. Four teachers participated in this field test. Our data showed that the following goals were achieved: (1) teachers reliably coded their own tapes, and (2) there appeared to be significant increases in the use of Categories 2, 3, and 4 behaviors, while Category 5 decreased. Our field test data also indicated some revisions were needed in both the handbook and tape materials. These changes were made in the late Summer of 1969.

Main Field Test

The main field test was conducted during the Fall of 1969 at four high schools (two public and two parochial) in the Bay area.

Twenty-four teachers initially volunteered to participate in the Main Field test. The research design was a pre-post course comparison of class discussions. The teachers were asked to conduct a 20 minute videotaped discussion with 15 pupils. The only restriction on the content was that it had been covered in class within the previous two weeks. After the course they conducted a similar type of lesson.

In addition, a common practice followed at the Far West Laboratory is to use the main field test situation to investigate at least one experimental hypothesis. The independent variable in this study was the effect of prior familiarization with the VTR equipment on teacher behavior in the pre-course tape. That is, does previous videotaping experience substantively alter pre-course performance?

In the two parochial schools (N=12) teachers were taped twice for a total of 40 minutes by the Laboratory staff before the actual pre-course taping. The teachers were completely free as to lesson form and content. Afterwards they were permitted to view their own performance. On the other hand, the public school teachers (N=12) were interviewed twice by Laboratory staff for a total of 40 minutes each. Staff assignments within each treatment were assigned randomly and all staff participated in both treatments.

Unfortunately, Minicourse 4 encountered a number of unexpected administrative problems during the main field test. To avoid repeating morbid details, suffice it to say that of the 24 teachers originally assigned, 19 carried out the course assignments at a level which made post-taping meaningful in some respect.[4] The difficulties included overwhelming administrative responsibilities, plus the fact that several teachers felt that they had been pressured into the

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[4]This group consisted of ten public school and nine parochial school teachers.

course and wanted out.

Analysis of the data

The data was analyzed to answer three questions: (1) Did the teachers reach our 80% correct criterion level in coding?; (2) What effects did prior videotaping have on the pre-course tapes?; (3) Did teacher behavior increase in Categories 2, 3, and 4 and decrease in Category 5?.

1. Coding Accuracy

To test teacher coding accuracy we asked the teachers to code their post-tapes. Of the 19 teachers who were post-taped, 10 carried out all the course assignments completely.[5] Their coding, we felt, would be most meaningful. We asked these teachers to code their post-tapes without a mechanical pacing device. Obviously this led to differences in the rate of scoring which had to be accounted for.

Two Laboratory raters also coded these 10 tapes, using a consecutive three second toning device as a mechanical pacer. This pacing was necessary, since the raters were required to resolve all differences in coding. This in turn required similar coding rates to establish common points in time. The code finially agreed-upon for each tape was used to evaluate teacher accuracy.

The usual procedure for establishing reliability in Flanders' system is the pi-coefficient (Scott, 1955). This index is devised by summing the total number of observations by the raters in each category, regardless of where they occured in the tape.

A more exacting measure of accuracy in coding is to compare observers sequence by sequence. That is, do the observers agree that they observed the same behaviors at the same point in time? Using this approach, rate is not

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[5]This group consisted of six public school and four parochial school teachers.

an error; rather the emphasis is on accuracy and inclusiveness.

For example, let us suppose the teacher coded a lecturing sequence 5-5-5, and our raters coded the same sequence 5-5-5-5-5. In our analysis, coding three 5's as compared to five 5's is not an error. Continuing our example, suppose the teacher now asks a questions. The 5-5-5-5-5 sequence becomes 5-5-5-5-5-4-4-4, etc. The shift in behavior from 5 to 4 is critical, and is counted as one instance of a behavioral shift. The next change in category is counted as a second behavioral shift. The Laboratory code was assumed to contain all instances of behavioral shifts in a given tape.

Interestingly enough, the mean number of behavioral shifts in the 10 tapes was 124.90. Our analysis of coding accuracy now is based on the correct identification of behavioral shifts. Again, this emphasizes accuracy and inclusiveness.

Three coding errors were possible:

1. Omission--the teacher left out a category. Thus, in the example given previously, the teacher did not code Category 4 as following Category 5.

2. Commission--the teacher added a category our raters could not find. Using the previous example, the teacher coded a non-existent category.

3. Incorrect categorization--the teacher incorrectly categorized the behavior. That is, instead of categorizing her questioning behavior as a Category 4, she categorized it as a Category 6.

Since the scoring rates for teachers and staff differed (teachers were scoring about every five seconds), all errors were coverted to percentages. The denominator for each subject was the number of behavioral shifts scored for that tape. Hence, if there were 100 behavioral shifts in the tape, and

teacher ommitted 10 of these, the omission error rate was 10%.

The mean percentages are given in Table 1.

Table 1
Percentage of Errors

Type of Error	Mean Percentage
Omission	15.65
Commision	6.56
Incorrect	16.21
Total	40.85

The teachers were scoring at about a 60% level of accuracy, which was below our 80% criterion. However, a detailed examination of the error pattern showed that things were not quite all that bad. For example, 50% of the error rate in the incorrect category was due to a systematic difference between teacher and the Laboratory staff as to how the 8-9 (pupil) categories were coded. Our staff consistently coded better pupil responses as Category 9, while teachers scored the same responses as examples of Category 8. It would appear that the validity of these categories depends in great measure upon how well the observer knows the lesson content as well as the pupil. Moreover, if this single 8-9 error pattern is deleted, the mean total error rate drops to 31.94 percent.

In addition, the percentage of commission errors may be exaggerated. This error category was confounded in part by the audio problem. For example, we found teachers frequently coding Category 3 behaviors, whereas our observers could not find this in the tapes. It is possible that the teachers who were familiar with the lesson recalled relatively brief and softly-spoken words of praise which were not picked up by the microphones.

It is not inconceivable that the true error rate is probably closer to 30% rather than 40%.

2. Familiarization with VTR equipment

The second question dealing with changes in Categories 2, 3, 4 and 5 could not be answered until the effects of the pre-tape treatments (taping vs. interviewing) could be assessed. If these treatments differentially effected the pre-course tapes, a covarience design would have been necessary to assess the changes.

All the pre- and post-tapes were scored by Laboratory raters using a three second mechanical pacing device. Interrater reliability was established on six tapes using Scott's Coefficient (1955). The median value was .85, which was considered acceptable. For purposes of comparison, all category sequences were converted to percentages. In addition to the 10 categories, the I/D ratio (a proportion), plus percentages of teacher and student talk were also computed.

We had 24 pre-tapes although only 19 post-tapes were available. Twelve Ss were from the taping treatment group, and 12 from the interview group. The pre-tape mean for both treatment groups are shown in Table 2 (p. 13). There were no differences between the two conditions with respect to the 10 categories, or the three interaction indices (I/D ratio, percentage of teacher talk, and percentage of student talk. This finding challenges the well established belief that previous videotaping experience substantively alters teacher behavior before a camera. At the very least, this question has been re-opened.

3. Changes in teacher behavior

Finally we come to the third question, which deals with changes in

Table 2

COMPARISON OF PRE-TAPES FOR TAPED VS. INTERVIEW TREATMENTS

Behavior	Taped Mean Percentage	Interview Mean Percentage	t
Cat. 1	.06	.03	.00
Cat. 2	3.32	3.97	.54
Cat. 3	4.19	3.20	.59
Cat. 4	16.29	22.18	1.51
Cat. 5	35.46	34.53	.13
Cat. 6	.33	1.53	1.10
Cat. 7	.54	.59	.94
Cat. 8	2.84	4.54	.39
Cat. 9	31.05	24.29	1.19
Cat. 10	7.82	6.27	.41
I/D Ratio[1]	1.15	1.61	.52
Teacher Talk	57.28	65.25	1.49
Student Talk	32.30	28.60	.66

[1] I/D ratio is a proportion

Categories 2, 3, 4 and 5. The data presented a problem, in that the 19 who were post-taped really represented two groups. One group (N=10) completed all course assignments; the second group (N=9) lagged in their microteaching assignments as well as missing an instructional lesson or two. Actually the presence of the two groups permitted us to analyze the data from an unexpected direction as we shall see shortly.

First, the pre and post course data for all 19 Ss were compared. Table 3 (p. 15) compares the pre and post course mean percentages for all 10 categories, as well as the I/D ratio, and percentages of teacher and student talk. To repeat a point made earlier, we were attempting to shift teacher behavior toward more indirect teaching.

Categories 2 and 3 increased significantly, while Category 5 decreased. All these changes were in the predicted direction. The increase in Category 4 was not significant, although it was in the predicted direction. It would appear that Minicourse 4 substantively altered teacher behavior in three of the four categories, and all four were in the predicted direction.

Other interesting findings were significant increases in Categories 1, 8 and 9, while Category 10 decreased. Among the interaction indices, two showed significant gains: (1) the I/D ratio increased from 1.5 to 1.8 and (2) student talk increased from 30.7 to 44.8. All these parallel previous trends toward indirect teacher influences as represented by Categories 2, 3, 4 and 5. Minicourse 4 was quite successful in modifying teacher behavior in the direction of the indirect influence mode.

However, the fact that almost half of the post-tape group missed microteaching assignments provided us with a means of exploring the

Table 3

POST TAPE

INTERVIEW AND TAPED TREATMENT GROUPS COMBINED

Category	Pre-tape Mean Percentage	Post-tape Mean Percentage	Sign Changes			Wilcoxon T	t
			+	0	-		
1	.00	.30	5	14	0	3.0	2.10*
2	3.57	4.67	10	5	4	30.5	2.17*
3	3.43	5.77	14	3	2	27.0	2.73**
4	19.91	20.65	12	0	7	84.5	.42
5	35.18	21.09	5	0	14	17.0	3.13***
6	.48	.46	4	11	4	35.0	.17
7	.51	.58	7	7	5	70.0	.10
8	4.02	8.45	13	2	4	14.3	3.10***
9	26.86	36.37	11	1	7	42.0	1.89*
10	6.20	1.56	1	5	13	6.5	3.18***
I/D Ratio[1]	1.52	1.85	14	1	4	51.0	1.77*
Teacher Talk	61.15	55.50	4	3	12	54.0	1.64
Student Talk	30.72	44.82	15	1	3	14.0	3.25***

* $p < .05$
** $p < .01$
*** $p < .005$

[1] I/D ratio is a proportion

relative contributions of microteaching and instruction. In short, how much of the observed changes in Categories 2, 3, 4 and 5 could be attributed to microteaching as compared to instruction alone?

To answer this question we dichotomized the 19 post tapes into two groups: (1) those who completed the course---the "completed" group (N=10) and (2) those who missed assignments--the "did not complete" group (N=9). Table 4 (p.17) compares the post tape behavior for both groups. Of the four critical categories (i.e. 2, 3, 4 and 5) only Category 3 differed significantly between the two groups. The "completed" group mean percentage was 7.37 as compared to 4.01 for the "did not complete" group. The groups appeared to be quite similar insofar as their post tapes were concerned.

We next investigated the possibility that the two groups differed in their pattern of change from pre to post tapes. Wilcoxon Ts were computed for the pre and post course percentages within each group. Tables 5 and 6 (pp.18 & 19) present the data for "completed" and "did not complete" groups. In the "completed" group, Category 2 significantly increased while Category 5 showed a significant decrease. These changes were in the predicted direction. In addition, although not significant, the changes in Categories 3 and 4 were also in the predicted direction. In addition, Categories 1, 8, and student talk increased, while Category 10 decreased.

As for the "did not complete" group, Category 3 showed a significant increase, while Category 5 significantly decreased. Categories 2 and 4 also showed trends in the predicted direction. Moreover, Category 9 as well as the I/D ratio and student talk also increased significantly.

Table 4

COMPARISON OF POST COURSE TAPES

FOR THE "COMPLETED" AND "DID NOT COMPLETE" GROUPS

Behavior	"Completed" Mean Percentage	"Did Not Complete" Mean Percentage	t
Cat. 1	.38	.20	.98
Cat. 2	5.31	4.59	.90
Cat. 3	7.37	4.01	2.38*
Cat. 4	23.16	17.88	1.01
Cat. 5	16.78	25.89	1.19
Cat. 6	.40	.53	.33
Cat. 7	.58	.59	.03
Cat. 8	13.40	3.05	3.00**
Cat. 9	30.36	43.05	1.39
Cat. 10	2.27	.86	3.00**
I/D Ratio[1]	2.08	1.61	1.09
Teacher Talk	54.12	57.04	.35
Student Talk	43.76	46.01	.27

* $p < .05$
** $p < .005$

[1] I/D ratio is a proportion

Table 5

PRE - POST COURSE COMPARISON OF THE "COMPLETED" GROUP

Behavior	Pre-Course Mean Percentage	Post-Course Mean Percentage	Wilcoxon T	t
Cat. 1	0.0	.38	0.0	1.83*
Cat. 2	3.68	5.31	6.0	1.95*
Cat. 3	4.48	7.37	11.0	1.68
Cat. 4	22.70	23.16	15.0	1.27
Cat. 5	28.99	16.78	5.0	2.29*
Cat. 6	.36	.40	13.0	.70
Cat. 7	.30	.58	3.5	2.03*
Cat. 8	6.21	13.40	6.5	2.14*
Cat. 9	24.20	30.36	15.0	.89
Cat. 10	9.09	2.27	0.0	2.67*
I/D Ratio[1]	1.49	2.08	17.0	1.07
Teacher Talk	60.39	54.12	17.0	1.07
Student Talk	30.64	43.76	7.0	2.09*

* $p < .05$

[1] I/D ratio is a proportion

Table 6

PRE - POST COURSE COMPARISON OF "DID NOT COMPLETE" GROUP

Behavior	Pre-Course Mean Percentage	Post-Course Mean Percentage	Wilcoxon T	t
Cat. 1	.09	.20	3.0	.73
Cat. 2	3.46	4.59	10.5	1.05
Cat. 3	2.27	4.01	1.0	2.55*
Cat. 4	16.82	17.88	19.5	.36
Cat. 5	42.03	25.89	6.0	1.95*
Cat. 6	.62	.53	5.0	0.0
Cat. 7	.74	.59	10.0	1.12
Cat. 8	1.60	3.05	10.0	1.12
Cat. 9	29.36	43.05	3.0	2.31*
Cat. 10	3.00	.86	5.5	1.44
I/D Ratio[1]	1.56	1.61	4.0	2.19*
Teacher Talk	62.01	57.04	12.0	1.24
Student Talk	30.82	46.01	6.5	1.90*

* $p < .05$

[1] I/D ratio is a proportion

The pattern of change in both groups is fairly similar. Furthermore, since the "did not complete" group missed primarily their microteaching assignments, it would appear that the training in Flanders' system, per se, could account for most of the changes in teacher behavior.

The apparent effectiveness of the instruction materials in changing teaching behavior was due to a number of reasons. One factor was that the training clips used were based on small group discussions. The examples probably placed indirect teaching (i.e. categories 1-4) in a more favorable light than direct teacher influence. Since we used experienced teachers, the transition from theory to practice was probably a relatively simple matter.

4. Matrix Analyses

The course only made a stab at matrix analysis. Although teachers could construct matrices by the end of the course, they were woefully inadequate in interpretation. The Laboratory staff took over the task and they reported that teachers were quite enthusiastic about the whole process once they understood what information could be gained.

Summary and Conclusion

To summarize Minicourse 4 accomplished the following:

(1) Coding accuracy was somewhere between 60-70% for teachers taking Minicourse 4. In addition, they coded at about a 5 second pace.

(2) Teachers increased their use of Categories 2, 3, and 4 and decreased Category 5 (in their discussion lessons). These changes appeared to be more a function of the instructional lessons rather than microteaching.

(3) The pre-course tape performance of teachers exposed to previous videotaping experiences did not significantly differ from a group which had

no prior familiarization.

Based on the first two conclusions, Minicourse 4 appears to be at least equal to if not better than the usual supervised procedures used to teach Flanders system. Coding accuracy is reasonably high, and the course does influence teachers toward more indirect teaching in discussions.

Future Plans

Minicourse 4 will be revised in the light of these results. Obviously, more testing is needed. Among the changes being considered are the following:

(1) More time will be alloted to coding and more training clips will be used which are taken directly from the classroom. Some teachers felt that the tranisition in coding from the more carefully paced and scripted training clips to the classroom tapes was too abrupt.

(2) Much more training in matrix analysis will be provided. This part of the course will be extended considerably beyond its present limits.

(3) We plan to follow up Minicourse 4 with a second minicourse. This course will help teachers change their classroom behavior based on interaction analysis data derived from their own teaching. If the coding and matrix analysis functions of Minicourse 4 are extended as we now contemplate, all attempts to directly influence teacher behavior may well be left to the new minicourse. That is, the last two instructional sequences may be deleted from Minicourse 4, and incorporated into the new minicourse. Parenthetically it might be noted that there are many pre and inservice training programs based around Flanders system, and their need is for a training program per se.

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APPENDIX I

Minicourse 4
OBJECTIVES AND DAILY COURSE SEQUENCE

A. General Objectives:

(1) Train teachers to categorize their own classroom behavior, using Flanders' System, to an 80% correct criterion level;

(2) Increase frequency in classroom discussions of categories 2, 3, and 4; and decrease frequency in category 5 behavior.

(3) Train teachers in the fundmentals of matrix analysis and its possible significance.

B. Daily Course Sequence

Day 1

Objectives: Learn use of VTR equipment.

Handbook: Before the next lesson, read the Preface and the Introduction to Minicourse 4.

Day 2

Objectives: Overall Introduction to Flanders' System.

Film Materials: Instructional Sequence 1.

Handbook: Sections 1 through 6.

Teacher Behavior:
1. Play through Instructional Sequence 1.
2. Read and carry out appropriate Handbook activities.

Day 3

Objectives: Train in identification of categories 1 and 2.

Film Materials: Instructional Sequence 2.

Handbook: Sections 7 through 12.

Teacher Behavior:
1. Play through Instructional Sequence 2.
2. Code Training Clips.
3. Read and carry out appropriate Handbook activities.

Day 4

Objectives: Train in identification of categories 3 through 4.

Film Materials: Instructional Sequence 3.

Handbook: Sections 13 through 17. (Optional--3A, 3B, 3C, 3D)

Teacher Behavior:
1. Play through Instructional Sequence 3.
2. Code Training Clips.
3. Read and carry out appropriate Handbook activities.

Day 5

Objectives: Train in identification of categories 5 through 7.

Film Materials: Instructional Sequence 4.

Handbook: Sections 18 through 28D

Teacher Behavior:
1. Play through Instructional Sequence 4.
2. Code Training Clips.
3. Read and carry out appropriate Handbook activities.

Day 6

Objectives: Train in identification of categories 8 through 10.
Determine discrimination level at the end of Instructional Sequence 5.
Prepare for microteach lesson on the following session.

Film Materials: Instructional Sequence 5.

Handbook: Sections 29 through 38.

Teacher Behavior:
1. Play through Instructional Sequence 5.
2. Code Training Clips.
3. Read and carry out appropriate Handbook activities.
4. Prepare microteach lesson 1.

Day 7

Objectives: Develop microteach skills.
Continue training in Flanders' System.

Film Materials: Practice tape.

Handbook: Sections 39 through 41.

Teacher Behavior:
1. Microteach lesson 1.
2. Code own tape.
3. Enter tallies into matrix and evaluate.

Day 8

Objectives: Further develop microteach skills.
Continue training in Flanders' System.

Film Materials: Practice tape.

Handbook: Sections 42 through 43

Teacher Behavior:
1. Microteach lesson 2.
2. Code own tape.
3. Enter tallies in matrix and evaluate.

Day 9

Objectives: Further develop microteach skills.
Continue training in Flanders' System.

Film Materials: Practice tape.

Handbook: Sections 44 through 46.

Teacher Behavior:
1. Microteach lesson 3.
2. Code own tape.
3. Enter tallies into matrix and evaluate.

Day 10

Objectives: Study specifc use of category 2 and 3 behaviors in classroom discussions.

Film Materials: Instructional Sequence 6.

Handbook: Sections 47 through 48.

Teacher Behavior:
1. Play through Instructional Sequence 6.
2. Read and carry out appropriate Handbook activities.
3. Prepare for microteach lesson 4.

Day 11

Objectives: Practice use of category 2 and 3 behaviors in a microteach setting.

Film Materials: Practice tape.

Handbook: Sections 49 through 52.

Teacher Behavior:
1. Carry out and record microteach lesson.
2. Code categories 1 through 10 on own tape.
3. Enter tallies in matrix and evaluate.
4. Prepare for reteach 4.

Day 12

Objectives: Further practice in use of categories 2 and 3.

Film Materials: Practice tape.

Handbook: Sections 53 through 55.

Teacher Behavior:
1. Carry out and record reteach lesson 4.
2. Code categories 1 through 10 on own tape.
3. Enter tallies in matrix and evaluate.

Day 13

Objectives: Study specific effects of category 4 and 5 behaviors in a discussion.

Film Materials: Instructional Sequence 7.

Handbook: Sections 56 through 57.

Teacher Behavior:
1. Play through Instructional Sequence 7.
2. Read and carry out appropriate Handbook activities.
3. Prepare for microteach lesson 5.

Day 14

Objectives: Practice teaching skills involving categories 4 and 5 in a microteach situation.
Continue training in Flanders' System.

Film Materials: Practice tape.

Handbook: Sections 58 through 61.

Teacher Behavior:
1. Carry out and record microteach lesson 5.
2. Code categories 1 through 10 on own tape.
3. Enter tallies into matrix and evaluate.
4. Prepare for reteach lesson 5.

Day 15

Objectives: Continue development of discussion skills involving categories 4 and 5.
Complete training in Flanders' System.

Film Materials: Practice tape.

Handbook: Sections 62 through 64.

Teacher Behavior:
1. Carry out and record reteach lesson 5.
2. Score categories 1 through 10 on own tape.
3. Enter tallies into matrix and evaluate.